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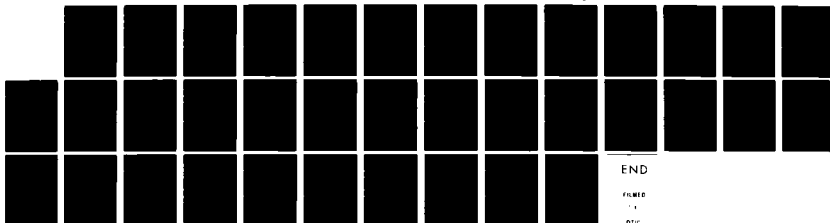
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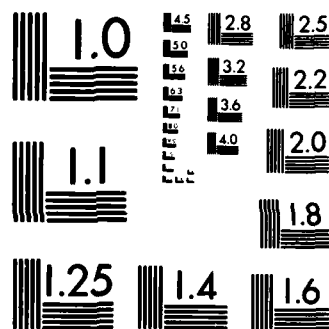
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Thane Gustafson

April 1982

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# THE SOVIET ECONOMY IN THE 1980s

Thane Gustafson

April 15, 1982

This article is the English version of a chapter scheduled to appear in the second annual report of the French Institute on International Relations (IFRI), Rapport Annuel Mondial sur le Système Economique et les Stratégies (Paris: Economica, 1982). The English edition of the full report will be published by Ballinger Press in summer 1982.

The Soviet economy faces in this decade the most fundamental peacetime problems it has known since the beginnings of the command system in the 1920s. What are the possible implications for Soviet military spending and foreign policy? Will economic constraints oblige the Soviet leadership to reduce its spending on the military sector, or at any rate to moderate the growth rate of arms spending? Will the Soviet leaders feel able to sustain the increasing costs of their foreign policies, especially in Eastern Europe? Will they face such difficulty that they will resort to draconian measures at home and adventure abroad as a means of maintaining their rule? Western analysts are virtually unanimous on the Soviets' economic difficulties but disagree among themselves about the implications. In this paper the reader will find some essential background information on the issues involved.

#### 1965-1980: Fifteen Years of Declining Performance

The last two years of the Tenth Five-Year Plan, 1979 and 1980, were unusually bad ones for the Soviet economy. GNP grew at an average rate of 1.2 percent per year. Much of that slow growth was due to bad harvests in both years: agricultural output, according to official Soviet figures, fell by 4 percent in 1979 and 3 percent in 1980.[1] But industry fared poorly too, growing at a rate of only 3 percent in each of those two years. Steel and coal output both fell, for the first time in Soviet peacetime history. Factor productivity in industry (labor and

[1] For a review of recent agricultural performance, see Douglas Diamond, "Soviet Agricultural Plans for 1981-85," in Seweryn Bialer and Thane Gustafson, eds., The Soviet Union at the Crossroads (London: George Allen & Unwin, forthcoming 1982).



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capital combined) declined at about 2 percent each year (1 percent a year in industry).[2]

Two bad years do not yet amount to a systemic crisis, as Prime Minister N. Tikhonov rightly reminded the West at the 26th Party Congress. But what made the performance of the second half of the 1970s so noteworthy is that, despite the exceptional circumstances that produced them, they were but the latest step in a long-term trend of deteriorating economic performance, as the accompanying table shows:

SELECTED ECONOMIC INDICATORS FOR THE SOVIET ECONOMY (Average annual rates of growth, in percent)			
	65-70	71-75	76-80
"Net material product" (Soviet official)			
"Produced"	7.7	5.7	4.5
"Utilized"	7.1	5.2	3.8
GNP (CIA)	5.3	3.8	2.8
Gross fixed capital (Soviet official)			
Investment	7.6	7.0	3.5
Stock	7.5	7.9	7.0
Population	1.0	0.9	0.9
Employment (adjusted for hours)	2.0	1.8	1.1
"Factor productivity"	1.3	-0.1	-0.3
Industrial output (Soviet official)	8.5	7.4	4.5
Group A (investment goods)	8.6	7.8	4.7
Group B (consumer goods)	8.4	6.5	3.8
Industrial output (CIA)	6.4	6.0	3.6
Agricultural output (Soviet official)	3.9	2.5	1.7
Agricultural output (CIA)	3.6	2.2	1.4
Consumption per capita	5.0	2.9	1.6

SOURCE: Bergson, 1981, p. 26.

[2] Calculations of Soviet factor productivity, together with extensive discussion of the methodological issues involved, can be found in Abram Bergson, "Soviet Technological Progress: Trends and Prospects," which is scheduled to appear as a chapter in a volume edited by Abram Bergson and Herbert Levine, on the Soviet economy toward the year 2000 (forthcoming, 1982).

In response, Soviet planners and leaders have been adjusting their sights downward. The five-year growth target for national income adopted in 1976, 4.7 percent per year, was the lowest that had ever been seen in a Soviet five-year plan; yet by 1980 even that modest goal was not met. The targets for the 11th Five-Year Plan, as we shall see, are lower still. The question is, are they low enough? Will the Soviet economy continue the modest if decelerating gains of the 1970s? Or will it keep declining along the steeper slope of 1979 and 1980? This section analyzes the main lines of the Eleventh Five Year Plan, followed by a discussion of Soviet performance in 1981.

The Soviet 11th Plan: Evidence of a Response to Gathering Troubles?

The draft 11th Five-Year Plan targets, as published before and during the 26th Party Congress in February 1981, were unprecedentedly modest by postwar Soviet standards. The implied growth target for GNP was about 4.0 percent per year,[3] considerably lower than what the Soviets had achieved during the preceding five-year plan. Central investment was likewise scheduled to grow more slowly; the increment was to be between 711 and 730 billion rubles, an annual increase of only 2.3 to 2.8 percent.[4] For certain major commodities the absolute output levels set for the 11th Five-Year Plan were the same as those initially

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[3] The Soviet target given in the Guidelines is 3.4 to 3.7 percent a year for average growth of net material product (utilized). The CIA, applying to this figure a Western definition of GNP and allowing for some difference in upward bias between Soviet output targets and Soviet data on realized output, translates the Soviet target into a Western-style GNP target of 4.0 percent a year. See Abram Bergson, "Soviet Economic Slowdown and the 1981-85 Plan," Problems of Communism, vol. XXX, no. 3 (May-June 1981), p. 26.

[4] Report by L.I. Brezhnev at the CPSU 26th Congress, as published in Pravda, 24 February 1981.



set five years before for the 10th Plan, and some were even lower. Thus the targets for oil and rolled steel were essentially the ones the leaders had hoped to reach in 1980; and those for coal and cement were lower.

	10th FYP (orig.)	1980 (act.)	11th FYP (draft)
OIL	620-640	603	620-645 Mtnat
COAL	790-810	716	770-800 Mtnat
ROLLED STEEL	115-120	103	117-120 Mtons
CEMENT	143-146	125	140-142 Mtons

SOURCES: Figures for 1980 are taken from Pravda, 24 January 1981; Figures for 1985 come from the Main Guidelines for the 11th Five-Year Plan, Pravda, 5 March 1981. Initial targets for the 10th Five Year Plan can be found in the Main Guidelines published in 1976, as reprinted in XXVyi. S"ezd KPSS (stenographic record), volume 2 (Moscow: Izdatel'stvo politicheskoi literatury, 1976), pp. 226ff.

In short, the leaders are being driven to revise the traditional Soviet strategy for growth; this can be seen most strikingly from the decline in the growth of central investment:

PLANNED CENTRAL INVESTMENT (average annual)			
8th Plan		7.6%	
9th Plan	98.6B	7.0%	
10th Plan	126.8B	3.5%	29% over 9th Plan
11th Plan (draft)	142-146B	1.9-2.8%	12-15% over 10th Plan

SOURCE: Brezhnev Report, Pravda, 24 Feb. 81.

The slow-down itself is not new; what is new is the rate it has now reached. The rate of capital investment had already begun declining in the 1970s from the 7.6 annual rate reached in the late 1960s; but what was unprecedented in the draft 11th Plan was the sharpness of the decline, which for the first time affected the overall share of national income going into investment. Instead of the historic records of 30 percent of national income invested in the 9th Plan and 31 percent in the 10th, the share of central investment in the 11th Plan was actually scheduled to decline slightly. National income would grow by 18 to 20 percent by 1985, but investment by only 12 to 15 percent.[5] As a result, the rate of growth of total fixed capital would likewise decline from 7.0 percent annual increase in the 10th Plan to 5.4 percent in the 11th.[6] In these respects, the draft 11th Plan marks a historic change.

In view of such sharply lowered investment targets, how did the Soviet leaders expect to maintain a 4.0 percent annual rate of growth of GNP? The logic of the draft 11th Plan depended above all on improving the productivity of labor and capital, which assumed in particular better luck in the weather for agriculture. In addition, by cutting the rate of growth of investment and applying marginally more resources to consumption, the planners hoped to boost incentives to workers, leading in turn to greater labor productivity. Bergson lists the following consumer related targets for the 11th Five-Year Plan:

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[5] Brezhnev Report, loc. cit.

[6] Bergson, op. cit.

CONSUMPTION-RELATED GOALS FOR 1980-85  
IN THE DRAFT 11TH FIVE-YEAR PLAN  
(average annual increase, in percent)

Agricultural output	4.8
Grain harvest	3.0-3.5
Meat production (slaughter wt.)	3.8
Milk production	0.9-1.3
Fish (marketed output)	1.9-2.3
Consumer goods industries	4.9-5.2
Leather shoes output	2.2
Cloth output	3.5
Real income per cap.	3.0-3.4

Such in brief were the main lines of the draft plan. After it was unveiled in late 1980 and formally presented to the Party Congress in early 1981, there followed several months of behind-the-scenes bargaining and maneuver. As a result, as we shall see, the final version of the Plan emerged with some important changes.

The Final Version of the 11th Plan, Actual Performance in 1981  
and Plans for 1982

When the final version of the 11th Five-Year Plan was unveiled in mid-November 1981 (about a month later than originally scheduled), it was apparent that the leaders' sights had been lowered still further.[7] The most startling change was that the projected rate of investment had been reduced even below the low end of the range given the previous February, from 710-730 to 700 billion rubles. This decision may reflect in part the concern of the Soviet leaders to maintain or increase consumption levels even in the face of declining economic growth.

[7] The highlights of the final version of the 11th Plan were presented by Brezhnev at a meeting of the CPSU Central Committee on November 16 and by Gosplan Chairman N.K. Baibakov before the USSR Supreme Soviet the following day. See Pravda, November 17 and 18, 1981.

Indeed, the stress in Brezhnev's November 1981 speech lay almost entirely on agriculture and the consumer sector, and Baibakov announced the next day that agricultural investment would retain the same share of national investment as in the previous plan, that is, "about 27%," or 190 billion rubles.[8] Despite the tight squeeze on investment funds, Brezhnev has evidently resisted pressure to cut the relative priority of agricultural investment below that of the last two five-year plans.

The Soviet leaders also announced in November that industrial investment would rise by 23 percent, i.e., more than twice the rate of increase for investment as a whole. The increment implied is about 51.5 billion rubles.[9]

If one adds up the implied increments for industry and agriculture, one reaches some startling totals: the sum of those increments is larger than the increment for investment overall--i.e., about 70 billion vs. 66 billion. Since investment in the transportation sector is also scheduled to increase (no exact figure has been mentioned, however), that necessarily implies that the remaining sectors of the investment budget, i.e., housing, construction, and trade and communal services, will be cut back slightly.

How do the Soviet leaders propose to maintain roughly the same growth rates as in the last Five-Year Plan while slowing down the rate of growth of investment? The Kremlin's answer to that question is the

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[8] This figure includes off-farm investment directly related to agriculture, but not the additional expenditures required for food processing and transportation. If the latter are included, so as to encompass the entire "agro-industrial complex," the share of total investment rises to about 33%. See Baibakov, *op. cit.*

[9] Industrial investment in the 10th Five-Year-Plan was 223.6 billion rubles. See *Narodnoe Khoziaistvo SSSR v 1980g*, (Moscow: "Statistika," 1981), p. 336.

same as in the draft version: the 11th Plan rests on what the Soviets call "intensification," i.e., more efficient use of existing resources rather than mobilization of additional ones. One way of doing that is by cutting back on new starts. Brezhnev announced in November, as he introduced the final version of the 11th Plan, that the five-year capital construction budget would be cut 30 billion rubles below the figure first given in the draft. The leaders are determined to concentrate on finishing existing construction projects rather than beginning new ones (more about that below) and to stress modernization of existing factories over construction of new ones (a strategy that implies a displacement of investment away from construction toward equipment).[10] Thus, while capital investment from the central budget is scheduled to rise by 11.2 percent by 1985, the amount of capital brought "on line" in the form of completed new capacity is supposed to increase by 21 percent.

The other key policy on which the success of the plan hinges is large increases in labor productivity, to be achieved through better management and more efficient technological innovation; over five years the Soviet leaders hope to gain 23 percent in industry and agriculture, and 15 percent in construction. So vital is the role of gains in labor productivity, in fact, that they are supposed to account for 90 percent of the five-year increment in industrial output, and the entirety of growth in agriculture and construction.

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[10] This has been a trend in Soviet investment for some time. Since the 7th Five-Year Plan (1961-65) the share of construction (stroitel'no-montazhnye raboty) in the overall capital investment budget has declined from 53 percent to 43 percent in the 10th Plan (1976-80). Narodnoe khoziaistvo SSSR 1980g, (Moscow: "Statistika," 1981), p. 335.

In sum, the 11th Plan is based on the wager that through "intensification" the economy can continue to grow even if investment is slowed, and yield a slightly more consumer-oriented mix of goods in the bargain. But to skeptical Western observers the Plan demands such a combination of efficiency and luck (the latter particularly in the form of good weather) that the main targets, modest as they are by historic standards, are unlikely to be reached.[11] If productivity growth continues downward as it did during the 1970s, the Soviet economy may only grow at 2 percent a year during the 11th Plan, and if there is bad luck (unusual drought or cold, for example), there may be no growth at all.

The results of the Plan's first year appear to bear out the skeptics. Indeed, it was already apparent, even as Brezhnev and Baibakov spoke in November, that 1981 was going to be another bad year for agriculture. This undoubtedly accounted for Brezhnev's concern to safeguard the investment share of the sector that has been his No. 1 domestic priority since the late 1960s. At the November 1981 plenum Brezhnev braced his audience for the worst by observing:

The experience of many years shows that we get unfavorable weather for agriculture nearly every other year. Consequently, we must regard it not as an exception, but as a rather common and natural phenomenon of our climate. There follow a number of practical implications ...

To reduce this vulnerability the final version of the 11th Five-Year Plan (like the last three ~~five-year~~ plans under Brezhnev) stresses reclamation and the production of fertilizers.

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[11] For an analysis of the 11th Five-Year on the basis of the initial draft figures, see Seweryn Bialer and Thane Gustafson, eds., The Soviet Union at the Crossroads, Allen & Unwin, 1982.

However, even to an audience that was thus forewarned, the final agricultural figures for 1981, announced in late January 1982[12], must have made discouraging reading. Indeed, total grain output was evidently so disastrous that no figure for it was announced at all. Judging by the record amounts of grain that Soviets have contracted to buy abroad (nearly 42 million tons), one may reasonably suppose that grain production declined by as much as 11 percent. If such is the case, then total agricultural output probably dropped by more than the officially announced 2 percent decline from 1980, which had already been a poor year.[13]

The rest of the economy fared somewhat better, but still considerably below plan in a number of important departments. Industrial output, in particular, was reported at 643 billion rubles, 10 billion rubles short of the target announced by Baibakov in November 1980, in other words, an increase of only 2.5 percent vs. the 4.1 percent planned. A comparison of figures for investment and labor productivity shows that the Five-Year Plan is losing ground just where Western critics felt it would: while overall investment performed just about as planned (138 billion rubles vs. the average of 140 targeted in the final five-year plan), only a slight reduction in uncompleted construction was reported for 1981 and labor productivity in industry grew by only 2.7 percent, as opposed to the growth rates of more than 4 percent called for in the plan. Thus it is precisely the "intensification" aspect of the 11th Plan that appears to be in trouble;

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[12] Ekonomicheskaya Gazeta, No. 5 (January 1982), pp. 5-7.

[13] See the discussion of the official Soviet statistics for 1981 in East European Statistics Service, Number 71, January 29, 1982.

and the answer to the question raised at the outset is that, for the moment, the Soviet economy in 1981 seems to have experienced much the same troubles as in 1979 and 1980, a combination of modest growth in industry and definite regression in agriculture.

As a result, at the end of 1981 one could find signs in the Soviet press of heightened concern over productivity (although the theme itself has been common currency for several years). For example, Academician Abel Aganbegian, the influential director of the Institute of the Economics and Organization of Industrial Production of the Siberian Division of the Academy of Sciences, reminded his readers in February 1982[14] that over 40 percent of all Soviet industrial workers, and an even higher proportion of construction workers, perform essentially manual work. Operations such as loading and unloading, lifting, assembling, and repairing are done largely without help from specialized machinery. Yet such machinery, writes Aganbegian, accounts for only 5 percent of the investment budget of the major industrial ministries. Self-criticism of this kind can be expected to become much more frequent as the 11th Plan continues; but so far no official Soviet source has hinted at the obvious question: how can any industrial ministry follow Aganbegian's advice when it faces tight output targets and a slow-down in the growth of investment?[15]

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[14] "Key Factor of Growth," Pravda, 24 February 1982.

[15] It can be argued that mechanizing auxiliary operations would be cheaper by a wide margin than investing in basic production processes, but it is likely that enterprise managers do not perceive the costs of the latter, since the personnel required for auxiliary operations may be manpower that the managers want to have on hand anyway, as insurance against the possibility of sudden upward revisions in output targets. Mechanization, in contrast, requires machinery that, according to Aganbegian, is largely unavailable on a centralized basis, if at all.



For most industrial ministries, investment will grow even more slowly than the overall figures suggest, for still another aspect of the 11th Plan has struck Western observers: it calls for a massive reallocation within the industrial sector, in favor of energy. In the past five or six years, energy has emerged as the chief new policy concern of the Brezhnev leadership, chiefly because of anxiety over the poor performance of the coal and electrical industries and the threat of a decline in oil output.[16] The draft five-year plan announced very ambitious targets for energy production; investment in the gas industry, in particular, was slated to double, to a level above 20 billion rubles. But no investment figures were announced at that time for other energy sources or related sectors such as energy transportation. Yet the very size of the output targets for 1985 implied that investment would have to increase by a very sizable fraction, perhaps even the totality, of the increment available for Soviet industry as a whole. This, in turn, implied that the political leadership in the Kremlin intended to force the other powerful claimants of Soviet industry, including the dozen-odd defense industries, to acquiesce in a constant level of investment for the next five years. Are the Soviet leaders really contemplating such a dramatic shift? Or do they plan reallocations within the industrial sector, preserving military output while cutting back on civilian?

The final targets announced in November 1981, after nearly a year of the tough interagency bargaining one can imagine, confirmed a sharp

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[16] For background on the recent evolution of Soviet energy policy, see Thane Gustafson, "Soviet Energy Policy, 1976-1982," in U.S. Congress, Joint Economic Committee, Soviet Economy in the 1980s: Problems and Prospects (Washington, D.C., USGPO, forthcoming).

turn toward energy in the industrial investment program. To be sure, most of the energy output targets were revised downward to the low end of the range proposed the year before; the only exception was gas, as can be seen in the table below:

	DRAFT	FINAL
OIL . . . . .	620-640 Mtnat	630
COAL. . . . .	770-800 Mtnat	775
GAS . . . . .	600-640 Bm3	630
ELECTRICITY . . . . .	1550-1600 BKw-hr	1555
of which HYDROPOWER	230-235 BKw-hr	230
and NUCLEAR . .	220-225 BKw-hr	220

However, according to Gosplan chairman Baibakov, overall investment in the energy sector during the 11th Plan will be 132 billion rubles, or an increase of 50% over the 10th Plan. The increase of 44 billion rubles implied thereby adds up to an astounding 85.6% of the planned increment for overall industrial investment! The implication of this figure is that, in addition to the questions raised earlier about the inner logic on which the 11th Plan rests, one must add two further questions: Can the energy sector absorb such a massive increase in funding in such a short time? And can the rest of Soviet industry meet its five-year targets with a virtual zero-growth investment budget? One can only wonder whether the Soviet leaders will be able to stick to their present course for the entire duration of the 11th Plan.

In fact, if the Soviet economy continues to grow as slowly as it has in the last three years, energy demand will also stagnate, and in

that case, the Soviets will not face an energy emergency at all. Once this fact begins to dawn on the Soviet leaders, pressures to cut the energy investment budget will surely mount.

So far, however, the Soviet leaders give every sign of sticking to their course. Indeed, in the gas industry the rate of expenditure is even higher than the five-year plan calls for: in 1981 that ministry was scheduled to get 5.3 billion rubles (a figure that does not include pipelines, a separate account), which if continued over the full five years of the plan, would give the gas industry considerably more than the 20-22 billion rubles that the five-year plan provides for it.[17]

The gas and oil industries performed well in 1981, but there were signs of trouble elsewhere in the energy sector, suggesting that even the large-scale transfusion of funds provided in the five-year plan may not be enough to avoid trouble. The coal industry, in particular, produced 2% less in 1981 than in 1980 (704 million tons vs. 716), and electricity output grew by only 30 billion kilowatt-hours, whereas to meet the five-year target it must grow at an annual average of 52. Other ominous signs include slow growth in output of steel pipe (0.5% growth over 1980), equipment for the oil industry (1% decline), and above all production of turbines (down a remarkable 20% in 1981),[18] as well as underfulfillment of the gas pipeline plan.[19]

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[17] "Zadachi rabotnikov gazovoi promyshlennosti na 1981 god i 11. piatiletku," Gazovaia promyshlennost', No. 4, 1981, pp. 2-7.

[18] Ekonomicheskaja gazeta, op. cit. It is conceivable that the poor record in turbine production reflects a decision to retool, in order to increase production of gas-turbine compressors for the gas pipeline program.

[19] "Po planam Partii," Stroitel'stvo truboprovodov, No. 1 (1982), pp. 2-4. This editorial does not give a figure on the extent of the shortfall, but only hints that the plan was not fulfilled. According to a slightly earlier article, gas pipeline construction in the first half of 1981 was dramatically short of plan targets, having reached only 2000 kilometers in operation, compared to a plan of 3500 kilometers. Sotsialisticheskii Trud, No. 12, 1981, p. 53.

To sum up, at the end of the first year of the 11th Plan, the doubts of Western observers about the plan's basic feasibility appear strengthened. As modest as the plan's targets appear, they do not seem to be modest enough. Yet, as Academician Aganbegian points out to unseen critics, so long as the Soviet economy remains locked in a basically "extensive" mode, cutting targets will only result in a further downward spiral:

You sometimes hear it said that the growth of disproportions is connected with the fact that plans are overstrained and targets too high. Let us lower them, they say, and remove the disproportions, and then we will develop more quickly. But with primarily extensive development a further slowing of the economic growth rate will lead only to a deepening of the disproportions, for then it will be necessary to reduce still further the size of capital investments, fuel supplies, and the allocations of new machinery to sectors. Only intensification can be the basis of proportional, balanced development.

#### Understanding the Soviet Decline: What Implications for the 1980's?

Western specialists do not agree among themselves on the precise mix of reasons why Soviet economic performance has been declining. We do not understand in detail, for example, the reasons why steel and coal output fell in 1979 and 1980, or why those years were so much worse than the recent Soviet average, even in industry. Neither do we understand the reasons for the catastrophic recent downturn in the productivity of new investment. This prevents Western specialists from agreeing on whether the Soviets will be able to muddle through during the decade of the 1980's, or whether they face a real decline. This paper will not take on the task of attempting to resolve these differences, but we may help the reader understand the reasons for them.

Broadly speaking, there are two classes of causes involved in the declining performance of the Soviet economy. Some are only indirectly connected with the nature of the Soviet system; they are primarily demographic and geographic features that would affect the Soviet Union regardless of its form of government or economic system. In contrast, there is a second group of factors that are directly related to the system of incentives, signals, and commands created by the centrally-planned system. Western specialists disagree about which of the two classes of effects, systemic or non-systemic, is more important in explaining Soviet troubles, and exactly how they are linked to one another[20]. Other factors, over which Western specialists also disagree, include the impact of military spending and the role of foreign trade.

#### Non-Systemic Factors

Among the non-systemic factors that will hamper the Soviet economy in the 1980's, one may begin with unfavorable demographic trends. The net growth of the Soviet labor force will slow to an average of 0.5% a year during the 1980's, compared to 1.0% during the 1970's. More serious, however, most of that growth will be concentrated in the non-Slavic areas of the south and east, and those additions to the labor force will consist of workers who, from the standpoint of Soviet

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[20] Philip Hanson, for example, stresses the non-systemic factors and tends to take a cautious position on the influence of the systemic ones, whereas Abram Bergson takes the opposite line. See for example Philip Hanson, "Economic Constraints on Soviet Policies in the 1980's," International Affairs, Vol. 57, No. 1 (Winter 1980-81), pp. 21-42. Hanson's position is all the more interesting when one recalls that he is the author of several major studies of Soviet technological innovation, and is therefore an authority on the systemic aspects of Soviet economic problems.

planners, are the least desirable, i.e., poorly-educated, non-Russian-speaking rural youth, lacking the skills and the discipline required by industry. Worse, they will be located where industry is not, yet they show little inclination to move from their rural homes and industry shows little to move to them. This problem of maldistribution is aggravated by the tendency of the Soviet labor force as a whole to migrate southward, reversing the traditional eastward flow that had prevailed for the last two centuries.[21]

A second non-systemic factor that is proving worrisome to Soviet planners is the declining quality and accessibility of key minerals. Energy is the most dramatic illustration: In the 1980s the Soviets will derive more than half their oil, coal, and gas from deposits located east of the Urals; and their exploration, development, and transportation costs are rising in proportion. In response, Soviet planners aim to process raw fuels locally by building up petrochemicals and power-generating facilities near points of extraction, and to substitute nuclear power for fossil-fired powerplants in the European part of the country.

Finally, one more broad non-systemic factor slowing Soviet economic growth is that its industrial structure is beginning to age. Extensive modernization and replacement will be required.

Although these problems are extra-systemic in nature, we should bear in mind that they are aggravated by the behavior of the command system. Demographic factors would not cause a labor shortage by themselves, if it were not for the fact that Soviet agriculture and

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[21] For a review of recent demographic trends in the Soviet Union, see Murray Feshbach, "Between the Lines of the 1979 Soviet Census," Problems of Communism, Vol. XXXI, No. 1 (January-February 1982), pp. 27-37.

industry overuse manpower. Factory managers, for example, find it advantageous to employ larger workforces than their Western counterparts, partly to handle a multitude of auxiliary tasks that in the West are performed by specialized sub-contractors and suppliers, and partly to maintain a labor reserve in case production targets are abruptly raised. To the extent that declining birthrates in Slavic areas are the culprit, that problem has a systemic aspect too: low consumer standards, the unavailability of basic services for young mothers, cramped housing, and the necessity for most women to hold full-time jobs, leads to childless or one-child families in the urban areas of Russia and the Ukraine.

Similarly, the worsening resource base, although to some extent a general phenomenon of older industrial societies, is aggravated in the Soviet case by the system's inefficient use of resource inputs. Energy use as a proportion of GNP, for example, is about twice that of Western Europe. The prospects for improvement in either the net energy intensity or the ratio of gross to net energy requirement are bleak. If present trends continue, they add up to the likelihood of a deterioration in the aggregate energy intensity of the Soviet economy over the next two decades. Indeed, the deterioration may have begun in the 1970s. Soviet economists continue to claim an elasticity of less than 1, but it appears that what enables them to do so is a convention for calculating GNP that excludes the slower-growing services sector, and even their analyses show a rising trend.[22]

In contrast, Robert Campbell's figures, based on Western estimates of Soviet GNP growth and his own calculations for energy consumption, show the following:[23]

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[22] S.N. Iatrov, "Toplivno-energeticheskii kompleks," Ekonomicheskaya gazeta, No. 10 (March, 1980), p. 10.

[23] Robert W. Campbell, "Energy in the USSR to the Year 2000," Bergson and Levine, eds., op. cit.

	Gross Energy Consumption	GNP	Coefficient of Elasticity
1965/60	5.9	4.9	1.20
1970/65	4.9	5.3	0.92
1975/70	4.0	4.1	0.97
1980/75	4.0	3.0	1.33

RELATIONSHIP OF ECONOMIC GROWTH TO ENERGY USE 1960-80  
(Increments expressed in average annual percentages)  
CAMPBELL'S FIGURES

Despite the important differences between the Soviet and Western figures, they both carry the same long-term implication: after a twenty-year period during which the Soviets actually achieved a certain measure of decoupling of economic growth and economic consumption, we are now witnessing a recoupling of the two.

The implications by the year 2000 could be dramatic. According to Robert Campbell[24], if one assumes an average annual growth rate of 2.5% and an elasticity of 1.0, gross energy consumption would reach 2500 million tons of standard fuel a year. That is close to what an optimistic forecast would predict for total primary energy production for that year. It is conceivable that there might be nothing left over for energy exports in any form. There is a close interaction, in other words, between the deterioration of the resource base and the dysfunctions of the command system.

[24] Campbell (1980), op. cit.



Finally, the aging of the entire industrial infrastructure is aggravated by the fact that Soviet managers have long been encouraged to skimp on maintenance and depreciation. Indeed, the funds they might have used for those purposes have frequently been skimmed off by their parent ministries for use in expanding new plants instead. We shall return to this phenomenon below.

In some cases the distortions induced by the political or economic system have been at work for so long that they appear to be built into the very structure of the industrial base. A prime example is agriculture. The Soviet Union's natural environment, on the whole, does not provide a favorable basis for agriculture: rainfall is either too sparse or irregular, and soils are too waterlogged or dry. But the natural disadvantages of geography have been worsened by the fifty years of neglect imposed on the countryside by a regime that was almost entirely turned toward industrial development. Only under Brezhnev has the government undertaken to reverse the damage caused in previous decades, by improving the economic incentives afforded to agricultural workers and by vastly increasing central investment in the countryside and in off-farm supporting industry. All told, the Soviet government has spent upwards of a trillion dollars on agriculture over the last fifteen years. Yet the results have been meager so far; although gross agricultural output has increased by about 60% under Brezhnev, nutritional standards remain poor, the country remains vulnerable to variations in weather, and the government appears inescapably tied to a high-cost agricultural program far into the future. The major reasons are not the natural environment but the complications induced by the

command system. The problem is not the collective farm, but the system that surrounds it: administrative interference with pricing and cropping decisions; inadequate support systems for rural transportation, food processing, supply of key inputs, and the short time horizons imposed on the farms by planners who are concerned above all with the nearest output targets. Above all, Soviet agriculture has not yet succeeded in overcoming the consequences of two generations of low political priority, which are by now built in to the habits and expectations of the entire society.[25]

#### Systemic Factors

One of the most common themes in Soviet literature is that the economy is in the process of making the transition between an "extensive" mode of growth to an "intensive" one. By that Soviet writers mean a shift from growth that is fueled primarily by additions to net factor inputs (without change in their productivity) to growth fueled by more productive use of static inputs. They acknowledge that during the first two generations of the Soviet period the extensive mode predominated. They see as the principal challenge of economic policy today to switch over to the second mode, and it has become common in Soviet newspaper articles for enterprise managers to list the percentage of their growth that is due to "intensification."

It is all the more striking, therefore, to observe that factor productivity in recent years has been stagnant, or even declining.[26] A

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[25] On recent agricultural policy, see D. Gale Johnson, "Agricultural Organization and Management in the Soviet Union: Change and Constancy," and Douglas B. Diamond, Lee W. Bettis, and Robert E. Kamsson, "Agricultural Production," both in Bergson and Levine, eds., op. cit.

[26] At least, this is the view of Abram Bergson and CIA economists. Philip Hanson takes a more cautious position. He writes: "We can be sure that a deceleration of input growth is contributing to

striking symptom of the dysfunctions induced by the command system is the enormous increase in uncompleted construction in the 1970's. This is partly a manifestation of the fact that Soviet ministries have an incentive to direct their investment resources toward building new enterprises rather than modernizing old ones. Then, because of difficulties in executing the project on time, construction schedules are stretched out into succeeding years and plan periods. Costs rise, which causes further stretch-outs. And in the 1970's, as central investment reached a record share of national income, uncompleted projects took on the proportions of an epidemic: whereas in 1965 the accumulation of so-called nezavershenka (uncompleted projects) stood at 29.6 billion rubles (a figure equal to 69 percent of annual investment), by the end of 1978 it had reached 99 billion rubles (85 percent of annual investment). The table below shows the growth, both in absolute amounts and as a proportion of annual capital investment:

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the deceleration in the growth of Soviet output. We cannot be sure that there is also a slowdown in the growth of total factor productivity--let alone that any such slowdown is attributable to a growing inappropriateness in the Soviet centrally-administered economic system." (Hanson, 1980, op. cit.)

UNCOMPLETED CONSTRUCTION (percentage of annual investment)					
1965	69	29.6B	1973	77	
1967	72		1974	77	
1968	77		1975	75	76.7B
1969	80		1976	80	84.0B
1970	73	52.5B	1977	85	92.5B
1971	74		1978	85	99.0B
1972	78		1979		

SOURCE: Nancy Nimitz, Rand Corp., work in progress.

Uncompleted construction is not in itself a "systemic cause" of poor economic performance; rather, it is a manifestation of deeper causes, among them artificially pumped-up demand for new investment, combined with a lack of countervailing incentives that would cause Soviet managers and planners to rein in their enthusiasm and concentrate their investment resources on modernization of existing plant and replacement of existing capital stock. In recent years, replacement funds (amortizatsionnye otchisleniia) have been systematically diverted to investment in new plant, a procedure whose costs were not evident at first, because so much Soviet plant and machinery was new. Now, however, Soviet sources discuss frankly the fact that depreciation and obsolescence are coming home to roost.[27] Nezavershenka and inadequate replacement are two sides of the same problem of inappropriate and unproductive investment.

[27] See V. Krasovskii, "Tekhnicheskoe perevooruzhenie proizvodstva i effektivnost' remonta," Voprosy ekonomiki, 7-1981, pp. 31-41, especially pp. 33-34. I am grateful to Nancy Nimitz for calling this article to my attention.

As a further example of the question marks that affect Western analysis of systemic factors, consider a recent debate between two specialists on the Soviet economy, Stanley Cohn and Alec Nove, on the estimation of the true current price of Soviet investments.[28] Alec Nove believes that if the official investment index were corrected for real price increases, it would show a decline in overall investment rather than a growth. Stanley Cohn believes that such price increases are a minor factor. The implications are important: if Nove is right, that implies, among other things, that the productivity of new Soviet investment is not as bad as the official Soviet figures make them appear, but that less real investment is taking place than the official index would have one believe.

An initial test of the disagreement, using the electric-power industry as a test case, suggests that Nove is right. According to Judith Thornton of the University of Washington, the cost of new power capacity has been increasing at an annual rate of at least 3.3 percent a year, and possibly much more. As a result, real capital investment in electric power actually fell during the Tenth Five-Year Plan. Such inflationary factors are sufficient to explain the slow-down in growth of that vital sector, in which only 69.7 percent of the original five-year plan for new capacity was actually completed (and only 56.5 percent for nuclear power). The practical implication is that such inflationary factors help to explain the slow-down in overall economic growth; and in particular, as far as the energy sector is concerned, more investment

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[28] Alec Nove, "Note on Growth, Investment, and Price Indexes," Soviet Studies, Vol. XXXIII, No. 1 (January 1981); Stanley H. Cohn, "A Comment on Alec Nove," and Alec Nove, "A Reply to Stanley Cohn," both in Soviet Studies, vol. XXXIII, no. 2 (April 1981), pp. 296-301.

will be required to meet the ambitious output goals of the 11th Five-Year Plan than the Soviet leaders have yet faced up to.[29]

THE CONNECTIONS BETWEEN SOVIET ECONOMIC PROBLEMS AND MILITARY SPENDING

If the Soviet economy continues to slow down, might the Soviet leaders be forced to moderate or even cut back their spending on military forces? Approaching this question is complicated by the fact that there is no solid agreement on how much the Soviets are spending. The CIA's estimates show that the share of defense spending in the Soviet GNP has increased only slightly in the last decade; those of William Lee show that the share of military programs has increased dramatically. Needless to say, depending on whether one chooses to believe one or the other, one tends to make quite different inferences about Soviet priorities and intentions, and also about the degree of strain the economy is operating under as a result of military spending:

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[29] Judith Thornton, "The Impact of Nuclear Power on the Cost of Capital in Soviet Electric Power" (Unpublished paper presented at the annual meeting of the American Association for the Advancement of Slavic Studies, Asilomar, California, September 1981).

ESTIMATES OF THE DEFENSE SHARE OF SOVIET GNP (Comprehensive Military Outlays 1955-1980)		
Lee	CIA	
1955	12.1	
1958	9.1	
1960	9.4	
1964	10.7	
1970	12.6	11-13
1975	14.4	
1980	18	12-14

SOURCE: Hearings on CIA Estimates, 1980, pp. 7, 21.

These differences are not trivial, since one of the chief questions at stake is whether, in a time of growing economic strain, the Soviet leadership has been increasing the share of its resources devoted to military programs or merely keeping it stable. Nevertheless, if one adopts the CIA estimates as a relatively conservative lower bound, the very least one can say is that we have a definite picture of a very large and growing military investment draining resources from an economy that is plainly in serious trouble.[30] It is the contrast between these two phenomena, more than the fine points of their measurement, that is the chief point for what interests us most in this chapter, namely, the perceived burden of military spending for the Soviet leaders.

[30] The CIA estimates that in the mid-1970's military uses absorbed about one-third of the Soviet output of the machine-building and metal-working industries, one-fifth of that of metallurgy, and one-sixth of the production of chemicals and energy. (Source: U.S. Congress, Joint Economic Committee, Subcommittee on Priorities and Economy in Government, Hearings on the Allocation of Resources in the Soviet Union and China, Washington, D.C., USGPO, 1977, p. 19, cited in Abraham S. Becker, The Burden of Soviet Defense (Santa Monica, Calif.: Rand R-2752-AF, October 1981), p. 18.

How Much of a Burden on the Economy Do Military Expenditures Amount To?

In this section we shall see that the share of military spending in the GNP and the burden of it as perceived from the Kremlin are not at all the same thing. The notion of burden requires some estimation of the marginal opportunity costs of Soviet military expenditure, i.e., the gains to the civilian economy forgone at the margin as a result of the use of resources in the military sector.[31]

The variant of this question that is presumably of greatest interest to the Soviet leaders is, how much relief to the civilian economy would accrue from marginal decreases in the rate of growth of the military sector? They cannot assume that a ruble withheld from weapons would necessarily yield a ruble's worth of benefit or more to the rest of the economy. It has long been supposed, at least in the West, that resources are more efficiently used in the military sector, although there is a lively debate among Western specialists over the reasons why. Some believe that the appearance of greater efficiency in the military is real, and is partly due to the fact that the military are not confronted with the same seller's market as their civilian counterparts, and consequently can be more judicious buyers. Others believe, in contrast, that the military only appears to perform more efficiently, but that the appearance is due to the military's long enjoyment of the highest political priority in the land, which guarantees them privileged access to the best that a command economy can offer.[32]

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[31] For a discussion of the concept of the burden of Soviet military spending on the economy, see Becker, The Burden of Soviet Defense, op. cit., pp. 3-12.

[32] The interested reader is referred to the contrasting views on this point of Gur Ofer and Nancy Nimitz. For the former, see The



This difference of view is important for our consideration of the benefits that would follow from a shift of resources away from the military. Those who believe that the military are fundamentally more efficient will conclude that the opportunity costs of military spending are less than the direct costs make it appear; those who invoke the central importance of priority will hold the opposite, because to the direct costs of military spending one must add the unaccounted-for costs of the priority system.[33]

In any event, there would be a necessary lag-time before resources diverted from the military would begin to produce major benefit elsewhere, even if one assumes that the shift could be smoothly and quickly implemented by the administrative and economic system. If one believes that the appearance of greater efficiency in the military sector is essentially due to the long application of political priority, the benefits of priority could presumably be transferred to high-priority civilian efforts, but the transfer could not take place quickly, for the accumulated effects of priority (such as the accumulation of superior managerial, scientific, and artisanal talent in the military-industrial sector) would take time to dissipate in the former high-priority area and to become fully effective in the civilian sector.[34]

Opportunity Cost of the Non-monetary Advantages of the Soviet Military R&D Effort (Santa Monica, California: Rand R-1741-DDRE, August 1975) and The Relative Efficiency of Military Research and Development in the Soviet Union (Santa Monica, California: Rand R-2522-AF, November 1980); for the latter see "Reform and Technological Innovation in the Eleventh Five-Year Plan," in Seweryn Bialer and Thane Gustafson, eds., The Soviet Union at the Crossroads (London: Allen & Unwin, 1982). The main points of both authors are summarized in Becker, op. cit., and Thane Gustafson, Selling the Russians the Rope? Soviet Technology Policy and U.S. Export Controls (Santa Monica, California: Rand R-2649-ARPA, April 1981).

[33] See Becker, The Burden of Soviet Defense, p. 10.

[34] The phenomenon of slow decay of political priority as the

In sum, the concept of burden is a difficult one to pin down. Nevertheless, there have been recent attempts by Western econometricians to develop more specific estimates of the consequences for overall growth and for consumption of various levels of military spending. One of the most sophisticated, a Klein-type model called SOVMOD developed by Herbert Levine and Daniel Bond for the Wharton Econometric Associates, has been used recently to investigate the effects of several alternative levels of military spending under various assumed conditions of productivity growth and overall economic growth.[35] Their model assumes 4.5 percent as the current share of military spending in GNP, and then investigates the effects of a "high" level of 7.5 percent and a "low" level of 2.5 percent, under two alternative rates of factor productivity growth, "low" (0.47 percent in the 11th Plan and 0.31 in the 12th) and "baseline" (1.35 percent in the 11th Plan and 0.97 percent in the 12th). Their results are summarized in the table below.

The most striking finding, although perhaps not the most surprising one, is that even fairly large changes in defense spending would have very little effect on overall GNP growth in the 1980s. The size of the capital stock is so large relative to the spending changes involved that it would take more than a decade for the latter to have pronounced

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Soviet system shifts resources from one sector to another can be seen particularly vividly in the case of agriculture, which passed fairly abruptly from the status of lowest-priority sector under Stalin to high-priority sector under Brezhnev. See Thane Gustafson, Reform in Soviet Politics (Cambridge: Cambridge University Press, 1981). In light of the achievements of the agricultural sector in the last fifteen years, any resources that the Soviet leaders might divert from the military to agriculture would do very little to improve the health of the civilian economy.

[35] Daniel L. Bond and Herbert S. Levine, "The 11th Five-Year Plan, 1981-1985," in Seweryn Bialer and Thane Gustafson, eds., The Soviet Union at the Crossroads (London: Allen & Unwin, 1982).

DEFENSE SHARES IN THE 1980s UNDER VARIOUS ASSUMPTIONS			
	Share of Defense in GNP	Share of Defense Increment in GNP Increment	Share of Defense Procurement Incre- ment in MBMW Incre- ment
Baseline			
1980-85	14	16	35
1985-90	15	21	54
Low Productivity			
1980-85	14	23	47
1985-90	16	32	82
High Defense			
1980-85	16	29	45
1985-90	20	44	78
Low Defense			
1980-85	13	9	26
1985-90	12	10	34
Low Productivity High Defense			
1980-85	17	40	60
1985-90	22	65	117
Low Productivity Low Defense			
1980-85	13	12	34
1985-90	13	15	51

SOURCE: Bond and Levine, op.cit.

effects. The picture is quite different, however, when we turn to effects at the margin, particularly in individual sectors. For example, Bond and Levine find that even under a simple extrapolation of present trends increases in military procurement will absorb more than half of the output of the machine-building and metalworking sectors (MBMW) in the second half of the 1980s and if one assumes "high" military growth and "low" productivity growth, then procurement will absorb more than

the entire increment. One need only recall our earlier figures on investment required in the energy area to see the potential for severe conflict.

The most dramatic effects found by Bond and Levine concern consumption. It is only if the rate of growth of military spending is cut to 2.5 percent a year (and all other conditions conform to the middle, "baseline" assumptions) that the leaders will be able to meet the consumption goals of the 11th Plan. If military spending were maintained at the 4.5 percent growth rate and productivity is "low" (as defined above), then consumption increases will drop to an annual average of 0.87 percent in the 11th Plan and 0.14 percent in the 12th.

The reaction of many of Bond and Levine's American colleagues to their projections is that, if anything, they underestimate the difficulties the Soviets will face if they attempt to maintain present growth rates of military spending, let alone increase them. Consequently, the consensus among most American specialists on the Soviet economy is that the Soviet leaders will indeed face unprecedented competition between military spending and other economic objectives in the 1980s, to such an extent that the Kremlin will be under strong pressure to moderate military spending in order to maintain at least minimal growth in other sectors of the economy.

But whether the Soviet leaders will respond to that pressure is quite another matter. We have already seen that it is not clear what the gains to the civilian economy would be from a marginal slow-down in military spending, partly because of unknown differences in efficiency between the two sectors, and partly because of the administrative and political difficulty of enforcing a shift toward the civilian sector in

a command economy that has been accustomed for two generations to doing the opposite. After all, we are talking about a system in which military representatives (voenpredy) are stationed at major enterprises to commandeer the output that meets the military's requirements, and even so high-priority an institution as the oil ministry is denied the high-quality steel it needs to make durable drill pipe. For such a long-established network of habits and expectations to be reversed to any meaningful extent, it would take more than marginal adjustments at the top.

Since what governs the leaders' behavior is not military shares of GNP, or military burden, but perceived burden, the reactions of the Kremlin in the 1980s will depend above all on what affects their perceptions, both of their internal economic troubles and their external security. If abrupt events occur at a time of political fluidity within the leadership, they may have a shock effect all out of proportion to the actual economic impact, inducing a sense of crisis among the leaders as no gradual deterioration of abstract economic indicators could. To take the energy sector as an example, one should watch for the leaders' reactions to symptoms of crisis such as electrical black-outs and brown-outs, abrupt discoveries of failure in highly-touted programs where the leaders had been hoping for breakthroughs (a recent example is the news of the dismissal of Deputy Oil Minister Khalimov for having covered up the figures that would have shown his total failure to make progress in enhanced oil recovery)[36]

In conclusion, at the end of the first year of the 11th Five-Year Plan we find conflicting evidence. On the one hand, the Kremlin has

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[36] See Sotsialisticheskaiia Industriia, 4 October 1981.

approved a dramatic reallocation of scarce capital and resources to the energy sector. If this shift actually proceeds as planned, the rest of Soviet industry, which includes the dozen-odd major military-industrial ministries, will be forced to divide up an investment budget that is essentially stagnant. Is this the beginning of a slow-down in the rate of growth of Soviet military spending? At the moment there is no sign. The answer depends, first of all, on whether the Kremlin actually sticks to the budget shares worked out in 1981. At this time of uncertain leadership in the Kremlin, nothing could be less sure than that. Within a year, the 11th Plan could be a dead letter.